

IN THE CLAIMS:

1-11. (Cancelled).

12. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon over an insulating surface;

forming an insulating film on said semiconductor film;

crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;

removing said insulating film by wet etching;

forming a gate insulating film on said semiconductor film after said removing said insulating film;

forming a gate electrode on said gate insulating film; and

forming source and drain regions in said semiconductor film by ion doping through said gate insulating film,

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

13. (Previously Presented) A method according to claim 37 wherein said channel formation region is substantially intrinsic type or p-type.

14. (Cancelled).

15. (Original) A method according to claim 12 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

16. (Previously Presented) A method according to claim 58, wherein said channel formation region is substantially intrinsic type or p-type.

17. (Original) A method according to claim 12 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

18. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon over an insulating surface;

forming an insulating film on said semiconductor film;

crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;

removing said insulating film by wet etching;

forming a gate insulating film on said semiconductor film after said removing said insulating film;

forming a gate electrode on said gate insulating film, said gate electrode having tapered side edges; and

forming source and drain regions in said semiconductor film by ion doping,

wherein said channel formation region between said source and drain region has a first length at a surface being in contact with said gate insulating film and a second length at a surface being in contact with said insulating surface, and said first length is shorter than said second length, and

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

19. (Previously Presented) A method according to claim 41 wherein said channel formation region is substantially intrinsic type or p-type.

20. (Cancelled).

21. (Original) A method according to claim 18 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus.

22. (Original) A method according to claim 18 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

23. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon over an insulating surface;

forming an insulating film on said semiconductor film;

crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;

removing said insulating film by wet etching;

forming a gate insulating film on said semiconductor film after said removing said insulating film;

forming a gate electrode comprising aluminum on said gate insulating film; and

forming source and drain regions in said semiconductor film by ion doping through said gate insulating film,

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

24. (Previously Presented) A method according to claim 55 wherein said channel formation region is substantially intrinsic type or p-type.

25. (Cancelled)

26. (Original) A method according to claim 23 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

27. (Original) A method according to claim 18 wherein said gate electrode is performed by a wet etching.

28. (Previously Presented) A method according to claim 23 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

29. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film comprising amorphous silicon over an insulating surface;
forming an insulating film on said semiconductor film;
introducing boron into at least a portion of said semiconductor film through said insulating film, said portion to become at least a channel formation region;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film by wet etching;
forming a gate insulating film on said semiconductor film after said removing said insulating film;
forming a gate electrode on said gate insulating film; and
forming source and drain regions in said semiconductor film by ion doping,
wherein the gate electrode comprises aluminum having a grain size of 1 μm .

30. (Previously Presented) A method according to claim 29 wherein said channel formation region is substantially intrinsic type or p-type.

31. (Original) A method according to claim 29 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

32. (Previously Presented) A method according to claim 29 wherein said forming said gate electrode is performed by a wet etching.

33. (Original) A method according to claim 29 wherein said semiconductor film comprising amorphous silicon has a thickness of 50 to 150 nm.

34. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming at least two active matrix panels over a substrate, a method for fabricating each of said active matrix panels comprising:

forming a semiconductor film on an insulating surface;

forming an insulating film on said semiconductor film;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film by wet etching;
forming a gate insulating film on said semiconductor film after said removing said insulating film;
forming a gate electrode on said gate insulating film;
forming source and drain regions in said semiconductor film by ion doping; and
cutting said substrate into at least two portions to obtain said at least two active matrix panels,
wherein the gate electrode comprises aluminum having a grain size of 1 μm .

35. (Previously Presented) A method according to claim 34 wherein said source and drain regions are formed by said ion doping with at least one of phosphorous and boron.

36. (Previously Presented) A method according to claim 34 wherein said semiconductor film has a thickness of 50 to 150 nm.

37. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film over an insulating surface;
forming an insulating film on said semiconductor film;
introducing boron into at least a portion of said semiconductor film through said insulating film, said portion to become at least a channel formation region;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film by wet etching;
forming a gate insulating film on said semiconductor film after said removing said insulating film;
forming a gate electrode on said gate insulating film, said gate electrode having tapered side edges; and

forming source and drain regions in said semiconductor film by ion doping,
wherein said channel formation region between said source and drain region has a first length at a surface being in contact with said gate insulating film and a second length at a surface being in contact with said insulating surface, and said first length is shorter than said second length, and

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

38. (Previously Presented) A method according to claim 37 wherein said source and drain regions are formed by said ion doping with at least one phosphorus and boron.

39. (Previously Presented) A method according to claim 37 wherein said semiconductor film has a thickness of 50 to 150 nm.

40. (Previously Presented) A method according to claim 37 wherein said forming said gate electrode is performed by a wet etching.

41. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a semiconductor film over an insulating surface;
forming an insulating film on said semiconductor film;
introducing boron into at least a portion of said semiconductor film through said insulating film, said portion to become at least a channel formation region;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film by wet etching;
forming a gate insulating film on said semiconductor film after said removing said insulating film;
forming a gate electrode comprising aluminum on said gate insulating film;
forming source and drain regions in said semiconductor film by ion doping through said gate insulating film,

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

42. (Previously Presented) A method according to claim 41 wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

43. (Previously Presented) A method according to claim 41 wherein said semiconductor film has a thickness of 50 to 150 nm.

44-45. (Cancelled).

46. (Previously Presented) A method according to claim 12 wherein said insulating film has a thickness of 10-500 nm.

47. (Previously Presented) A method according to claim 18 wherein said insulating film has a thickness of 10-500 nm.

48. (Previously Presented) A method according to claim 23 wherein said insulating film has a thickness of 10-500 nm.

49. (Previously Presented) A method according to claim 29 wherein said insulating film has a thickness of 10-500 nm.

50. (Previously Presented) A method according to claim 34 wherein said insulating film has a thickness of 10-500 nm.

51. (Previously Presented) A method according to claim 37 wherein said insulating film has a thickness of 10-500 nm.

52. (Previously Presented) A method according to claim 41 wherein said insulating film has a thickness of 10-500 nm.

53. (Currently Amended) A method for fabricating a thin film transistor of a pixel portion in a semiconductor device, said semiconductor device having at least one thin film transistor comprising a semiconductor film formed adjacent to a gate electrode with a gate insulating film therebetween, said method comprising the steps of:

forming said semiconductor film over a substrate;

forming an insulating film on said semiconductor film;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film; and
forming source and drain regions in said semiconductor film by ion doping,
wherein said gate insulating film is formed using TEOS,
wherein the gate electrode comprises aluminum having a grain size of 1 μm .

54. (Previously Presented) A method according to claim 53, wherein said semiconductor film has a thickness of 50 to 150 nm.

55. (Currently Amended) A method for fabricating a thin film transistor of a pixel portion in a semiconductor device, said semiconductor device having at least one thin film transistor comprising a semiconductor film formed adjacent to a gate electrode with a gate insulating film therebetween, said method comprising the steps of:

forming said semiconductor film over a substrate;
forming an insulating film on said semiconductor film;
introducing boron into at least a portion of said semiconductor film through said insulating film, said portion becoming at least a channel formation region of said thin film transistor;
crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;
removing said insulating film; and
forming source and drain regions in said semiconductor film by ion doping,
wherein said gate insulating film is formed using TEOS,
wherein the gate electrode comprises aluminum having a grain size of 1 μm .

56. (Previously Presented) A method according to claim 55, wherein said semiconductor film has a thickness of 50 to 150 nm.

57. (Previously Presented) A method according to claim 55, wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

58. (Currently Amended) A method for fabricating a semiconductor device comprising the steps of:

forming at least two active matrix panels over a substrate, a method for fabricating each of said active matrix panels comprising:

forming a semiconductor film comprising amorphous silicon over a substrate;

forming an insulating film on said semiconductor film;

introducing boron into at least a portion of said semiconductor film through said insulating film, said portion becoming at least a channel formation region of said thin film transistor;

crystallizing at least an entire channel formation region of said semiconductor film by laser irradiation through said insulating film;

removing said insulating film;

forming a gate insulating film on said semiconductor film;

forming a gate electrode on said insulating film;

forming source and drain regions in the said semiconductor film by ion doping; and

cutting said substrate into at least two portions to obtain two active matrix panels,

wherein the gate electrode comprises aluminum having a grain size of 1 μm .

59. (Cancelled).

60. (Previously Presented) A method according to claim 58, wherein said semiconductor film has a thickness of 50 to 150 nm.

61. (Previously Presented) A method according to claim 58, wherein said source and drain regions are formed by said ion doping with at least one of phosphorus and boron.

62-64. (Cancelled).

65. (Previously Presented) A method according to claim 58 wherein said gate insulating film comprises TEOS.

66. (Previously Presented) A method according to claim 18 wherein said gate insulating film comprises TEOS.

67. (Previously Presented) A method according to claim 23 wherein said gate insulating film comprises TEOS.

68. (Previously Presented) A method according to claim 29 wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

69. (Previously Presented) A method according to claim 34 wherein said gate insulating film comprises TEOS.

70. (Previously Presented) A method according to claim 37 wherein said gate insulating film comprises TEOS.

71. (Previously Presented) A method according to claim 41 wherein said gate insulating film comprises TEOS.

72-74. (Cancelled).

75. (Previously Presented) A method according to claim 12 wherein said semiconductor device is a liquid crystal display.

76. (Previously Presented) A method according to claim 18 wherein said semiconductor device is a liquid crystal display.

77. (Previously Presented) A method according to claim 23 wherein said semiconductor device is a liquid crystal display.

78. (Previously Presented) A method according to claim 29 wherein said semiconductor device is a liquid crystal display.

79. (Previously Presented) A method according to claim 34 wherein said semiconductor device is a liquid crystal display.

80. (Previously Presented) A method according to claim 37 wherein said semiconductor device is a liquid crystal display.

81. (Previously Presented) A method according to claim 41 wherein said semiconductor device is a liquid crystal display.

82. (Previously Presented) A method according to claim 53 wherein said semiconductor device is a liquid crystal display.

83. (Previously Presented) A method according to claim 55 wherein said semiconductor device is a liquid crystal display.

84. (Previously Presented) A method according to claim 58 wherein said semiconductor device is a liquid crystal display.

85. (Previously Presented) A method according to claim 53, wherein said insulating film has a thickness of 10-500 nm.

86. (Previously Presented) A method according to claim 55, wherein said insulating film has a thickness of 10-500 nm.

87. (Previously Presented) A method according to claim 58, wherein said insulating film has a thickness of 10-500 nm.

88. (Previously Presented) A method according to claim 12, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

89. (Previously Presented) A method according to claim 18, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

90. (Previously Presented) A method according to claim 23, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

91. (Previously Presented) A method according to claim 34, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

92. (Previously Presented) A method according to claim 37, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

93. (Previously Presented) A method according to claim 41, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

94. (Previously Presented) A method according to claim 53, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

95. (Previously Presented) A method according to claim 55, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.

96. (Previously Presented) A method according to claim 58, wherein said semiconductor film is irradiated through said gate insulating film and said gate electrode after forming source and drain regions.